Course Outline

1. Document Information

Degree Program	Computer Science
Course Number	CS 320
Course Title	Computer Organization and Architecture
Semester Hours	3
Course Coordinator	Xiaolan Huang
Revision Term	Spring 2020
Latest Revision	Spring 2020

2. Catalog Description

Overview of the basic logic circuits needed in constructing a computer. Fundamental computer operations: machine and assembly language instructions, stacks, procedures and macros. The translation process: assembly, linking and loading. Hardware elements for processing, transferring, and storing information. Data path and control unit for a simple processor.

3. Textbooks

- Patterson, D. & Hennessy, J. L. (2017). Computer Organization and Design RISC-V Edition: The Hardware Software Interface. Morgan Kaufmann Publications, ISBN: 978-0128122754.

4. References

5. Course Learning Outcomes

- To learn the basic concepts and elements of computer systems.
- To understand machine and assembly language programming.
- To extend this knowledge to the translation process and the systems programs that is part of the hardware/software interface.

- To learn the basic hardware for processing, storing, and moving information, and how they are organized within the internal architecture of a computer.
- To learn how to design a simple processor.

6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6
Assessed	X	X			X	

7. Prerequisites by Topic

CS 220 with grade of C or better.

8. Major Topics Covered in the Course

1. Overview of basic logic circuits {4 classes}
2. Computer operations: machine and assembly language instructions, stacks, procedures, macros {9 classes}
3. Assembly language programming {6 classes}
4. Translation: assemblers, linkers, loaders, stack management, recursion {8 classes}
5. Hardware elements for processing, transferring, and storing flip-flops, triggering of flip-flops, sequential and finite state machines, state assignment problems, design procedure, analysis procedure, races {6 classes}
6. Hardware Design and Control
7. Data path, control units, and design of a simple processor {4 classes}